

INSTRUCTION MANUAL

No.243U

Kitagawa TETRAETHOXYSILANE DETECTOR TUBES

- ★ READ CAREFULLY THIS INSTRUCTION MANUAL AND THE INSTRUCTIONS OF THE ASPIRATING PUMP PRIOR TO USING THIS PRODUCT.
- ★ DON'T DISCARD THIS INSTRUCTION MANUAL UNTIL ALL THE TUBES IN THIS BOX ARE USED UP.

1. PERFORMANCE:

Measuring Range	5 - 80 ppm	12.5 - 200 ppm
and Sampling Time:	(2 pump strokes) (3 minutes)	(1 pump stroke) (1.5 minutes)

Graduations on the detector tube are based on 2 pump strokes.	
Colour Change:	Yellow → Pale blue
Detectable Limit:	1 ppm (2 pump strokes)
Operating temperature:	0 - 40 °C (32-104°F) (Temperature correction is necessary.)
Aspirating Pump:	Model AP-1, AP-1S, 400A or AP-400

CAUTION

1. DETECTOR TUBE CONTAINS REAGENTS.
2. DON'T TOUCH THESE REAGENTS DIRECTLY ONCE TUBES ARE BROKEN.
3. KEEP THE TUBES OUT OF THE REACH OF CHILDREN.

NOTICE

1. USE ONLY WITH PUMP MODELS AP-1, AP-1S, 400A OR AP-400. OTHERWISE, CONSIDERABLE ERROR IN INDICATION MAY OCCUR.
2. DON'T USE FLOW CONTROL ORIFICE WITH THIS TUBE. (FOR MORE DETAIL, REFER TO THE INSTRUCTIONS OF THE ASPIRATING PUMP.)
3. BEFORE TESTING, CHECK THE ASPIRATING PUMP FOR LEAKS (REF. ITEM 7). ANY PUMPS SHOWING SIGNS OF LEAKAGE SHOULD BE CORRECTED BEFORE USE.
4. DON'T USE THIS TUBE OUTSIDE THE STATED OPERATING TEMPERATURE RANGE.
5. STORE TUBES IN A COOL AND DARK PLACE (0-25 °C/32-77°F), AND USE BEFORE EXPIRATION DATE PRINTED ON TOP OF THE BOX.
6. PRIOR TO USE, READ CAREFULLY ITEM 8 "USER RESPONSIBILITY".

2. SAMPLING AND MEASUREMENT:

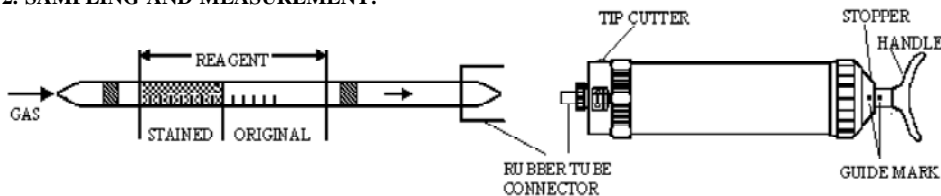


Fig.1

- ① Break both ends of detector tube.

CAUTION SAFETY GLASSES AND GLOVES SHOULD BE WORN TO PREVENT INJURY FROM SPLINTERING GLASS.

- ② Insert the detector tube into aspirating pump securely as shown in Fig.1. (Arrow mark shall point to the pump.)
- ③ Align the guide marks on the shaft and stopper of the aspirating pump.
- ④ Pull the pump handle at full stroke until it locks and wait for 1.5 minutes or until the completion of sampling is confirmed with the flow indicator of the pump (See descriptions about the flow indicator in the instructions of the pump).
NOTE: If using Model AP-400, pull pump handle to full stroke and turn the handle by 1/4 (90°), then wait for 1.5 minutes.
- ⑤ Push the handle without removing the detector tube from the inlet, and air in the pump will be discharged perfectly. Then repeat the step ④ once.
- ⑥ On completion of sampling, read the scale at the maximum point of the stained layer.
- ⑦ In case of 1 pump strokes, push the handle once more without removing the detector tube from the

pump inlet, turn it right or left 1/4 and repeat step ④ once.

- ⑦ In this case, actual concentration is half of the reading value.

SPECIAL NOTE: I. The scale is calibrated at 20 °C (68°F) and 1013hPa. Readings obtained in other circumstances should be corrected (REF. ITEM 3).
II. When the maximum point of the stained layer is unclear, read the scale at the centre between the longest and shortest points.

3. CORRECTION FOR AMBIENT CONDITIONS:

- ① Temperature; Correct the tube reading by following temperature correction table.

Tube Readings (ppm)	Temperature Correction Table					
	Corrected Concentration (ppm)					
	0 °C (32°F)	5 °C (41°F)	10 °C (50°F)	20 °C (68°F)	30 °C (86°F)	40 °C (104°F)
80	110	100	90	80	72	64
60	80	75	70	60	54	45
40	56	52	47	40	33	28
20	27	25	23	20	16	14
10	13	12	11	10	8	7
5	6	5	5	5	5	4

- ② Humidity; No corrections are necessary.

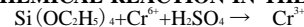
- ③ Atmospheric Pressure;

$$\text{True concentration} = \frac{\text{Temperature corrected concentration} \times 1013}{\text{Atmospheric pressure (in hPa)}}$$

4. INTERFERENCES:

Silane, Trichloroethylene or Tetrachloroethylene does not affect the reading value. Phosphine, Isopropyl alcohol or Ethanol produces a similar stain and coexistence with Tetraethoxysilane will give higher readings.

5. CHEMICAL REACTION IN THE DETECTOR TUBE:



6. DISPOSAL OF TUBE:

USED TUBES SHOULD BE DISCARDED CAREFULLY ACCORDING TO RELEVANT REGULATIONS, IF ANY.

7. INSPECTION OF ASPIRATING PUMP:

Checking for leaks;

- ① Insert sealed, unbroken detector tube into the pump.
- ② Align the guide marks on the shaft and stopper of the pump.
- ③ Pull the handle to full stroke and wait for 3 minutes. (If using Model AP-400, turn the handle by 1/4 (90°) to lock it.)
- ④ Unlock the handle and allow it to return slowly into the pump by holding the cylinder and handle securely.
CAUTION HANDLE WILL TEND TO SNAP BACK INTO THE PUMP QUICKLY.
- ⑤ If the handle returns completely to the original position, the performance is satisfactory. Otherwise, refer to maintenance procedure in the pump instructions to correct the fault.

8. USER RESPONSIBILITY:

It is the sole responsibility of the user of this equipment to ensure that the equipment is operated, maintained, and repaired in strict accordance with these instructions and the instructions provided with each Model AP-1, AP-1S, 400A or AP-400 aspirating pump, and that detector tubes are not used which are either beyond their expiration date or have a colour change different to that stated in the Performance specifications.
The Manufacturer and Manufacturer's Distributor shall not be otherwise liable for any incorrect measurement or any damages, whether damages result from negligence or otherwise.

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